

In the Abstract:

A radioactive emission probe in communication with a position tracking system and the use thereof in a variety of systems and methods of medical imaging and procedures, are provided. Specifically, wide-aperture aperture collimation - deconvolution algorithms are provided, for obtaining a high-efficiency, high resolution image of a radioactivity emitting source, by scanning the radioactivity emitting source with a probe of a wide-aperture collimator, and at the same time, monitoring the position of the radioactive emission probe, at very fine time intervals, to obtain the equivalence of fine-aperture collimation. The blurring effect of the wide aperture is then corrected mathematically. Furthermore, an imaging method by depth calculations is provided, -based on the attenuation of photons of different energies, which are emitted from the same source, coupled with position monitoring.